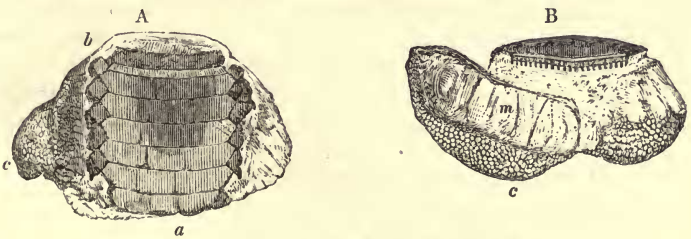
fin, which scarcely exists in the Rays. The anal fin is also wanting in the Rays, it is also wanting in the Torpedos; but all these fishes have a complete caudal fin, whereas it is wanting in the Rays, as I have just observed.

I am indebted to the kindness of M. Bibron for being enabled to ascertain that the other fishes allied to the Rays (*Cephaloptera, Myliobates* and *Pastinacus*) whose tail is terminated by a thin and extended whip or prolongation, do not possess this apparatus. The whip is formed of a portion of the tail, which the electrical apparatus would occupy if it existed.

As we have just seen, this organ cannot be regarded as a gland, for it has not the structure of one; it does not possess an excretory duct, it does not communicate in any part with the inside, and no gland receives so many nerves of animal life*.

IV.—*Notice of an Ichthyolite from Sheppey, in the collection of Mr. Tennant, F.G.S.* By Prof. Owen, F.R.S.

The unfrequency of the discovery of any part of the internal skeleton of the cartilaginous fishes associated in a fossil state with the teeth, which are the most common evidences of the extinct *Chondropterygii*, induces me to send the following description of the Ichthyolite figured in cuts A and B, which has been kindly transmitted to me for that purpose by Mr. Tennant, F.G.S. It was found in the well-known and rich fossiliferous deposit of London-clay at the Isle of Sheppey, and consists of a portion of the premandibular bone (*c*) with six of the large median (*a*) and a few of the small lateral (*b*) dental plates of the extinct species of Eagle-ray, called by M. Agassiz '*Myliobates striatus.*'



Fossil under jaw of *Myliobates striatus.*

The first appearance likely to attract attention in the portion of lower jaw here preserved is that of a large medullary cavity at

* Nevertheless the proof of its being an electrical organ must depend upon its power of giving electric shocks. Such a property, in our common Rays, if it existed, could hardly have escaped the notice of fishermen, in the constant habit of handling large Rays, Skates and Thornbacks immediately after their capture.—Ed.

m, fig. B, an appearance affecting at first sight a general character attributed to the bones of fishes *, and apparently at variance with the known laws of development of the osseous tissue in the existing members of the class.

In most Vertebrata, as is well known to physiologists, extension of parts is not the sole process which takes place in the growth of bone: to adapt the bone to its destined office, changes are wrought in it by the absorption of parts previously formed, chiefly in the interior. In the growth of the bones of fishes such internal changes have not been observed, and hence the character assigned to them by Prof. M. Edwards; and in point of fact, most of the bones of recent fishes are solid or spongy in their interior. The bones of the Chelonia are likewise solid: a coarse diploë fills the interior of the long bones of the extremities, and we find a similar structure in the bones of the *Cetacea* and *Phocidæ*. Among terrestrial mammals also, the inactive Sloths, both recent † and extinct ‡, have the long bones of the extremities solid; whilst the agile Antelopes have their diaphyses in the condition of hollow columns; the strength and lightness of the bones being increased by the progressive absorption of the first-formed osseous substance, which is removed from within as new bone is deposited from without. The ribs of the large Ophidians, which serve them as legs, have likewise their medullary cavities; and the bodies of the vertebræ of some Lizards, and of the great extinct *Poikilopleuron*, are similarly excavated. These medullary cavities become filled with spar or matrix in fossil marrow-bones: and the same infiltration of foreign matter in the cavities of such bones of cartilaginous fishes, as the jaw of the *Myliobates* here described, might seem to indicate that there had been an original formation of a medullary cavity in it by the action of the absorbents on a primitively solid bone. This however is not the case: in most *Chondropterygii* an osseous crust is formed upon the periphery of the original cartilage; the crust consists, as in the fossil (figs. A, B, *c*), of prismatic pieces, which under the microscope present oval calcigerous cells about $\frac{1}{300}$th of an inch in diameter, but without conspicuous radiating tubes: the ossicles closely resemble in tissue the plates and tubercles (placoid scales) on the integument; but in the fossil this tessellated crust of bone may be traced passing beneath the posterior dental plates.

The cavities which such partially ossified bones of fishes appear, when seen in the fossil state, to have had while recent, were

* "Les os ne présentent jamais de canal médullaire," Milne Edwards, Elémens de Zoologie, Classe des Poissons, p. 690, 1834.

† De Blainville, Ostéographie de Paresseux, p. 1.

‡ Owen, Memoir on the Mylodon, 4to, pp. 83, 112.